Claims

What is claimed is:

1. An optical apparatus for exposing light on a surface area of an object having a curvature, comprising:

a mask adapted for receiving the light and passing the light to the surface area of the object; and

a lens positioned between the mask and the object such that a focal distance between the lens and the object is variable to expose the light passed by the mask on surface areas of the object.

2. The optical apparatus of claim 1, wherein the object is a spherical object.

3. The optical apparatus of claim 2, wherein the spherical object is a semiconductor device.

4. The optical apparatus of claim 1, wherein a pattern of the mask comprises a first ring and a first focal distance is made between the lens and the object to expose the first ring on a first surface area of the object.

5. The optical apparatus of claim 4, wherein the pattern of the mask comprises a second ring and a second focal distance is made between the lens and the object less than the first focal distance to expose the second ring on a second surface area of the object.

6. The optical apparatus of claim 1, further including:

a motor coupled for receiving a control signal;

a travel assembly coupled to a shaft of the motor; and

a moveable arm having a first end coupled to the travel assembly and a second end coupled to the object for moving the object relative to the lens.

7. The optical apparatus of claim 1, wherein the mask includes:

a mask pattern generator having a plurality of mirrors which are configurable; and

a mask pattern controller operating in response to control signals and providing a mask pattern to the mask pattern generator to configure the plurality of mirrors.

8. The optical apparatus of claim 7, wherein the mask pattern generator comprises a digital mirror device.

9. A method of exposing light on a surface area of an object having a curvature, comprising:

passing light according to a pattern of a mask;

directing the light passed by the pattern of the mask though a lens to the surface area of the object; and

altering a focal distance between the lens and the object to expose the light passed by the pattern of the mask on surface areas of the object.

10. The method of claim 9, wherein the object is a spherical semiconductor device.

11. The method of claim 9, further including:
providing a first ring for the pattern of the mask; and
programming a first focal distance between the lens and the object to expose the first ring on a first surface area of the object.

12. The method of claim 11, further including:
providing a second ring for the pattern of the mask; and
programming a second focal distance between the lens and the object to expose the second ring on a second surface area of the object.

13. The method of claim 12, further including moving the object relative to the lens to set the first and second focal distances between the lens and the object.

14. An optical apparatus for exposing light on a surface area of an object having a curvature, comprising:
first and second optical stations each including,
(a) a mask adapted for receiving light and passing the light to the object in accordance with a pattern of the mask, and
(b) a lens positioned at a focal distance between the mask and the object,
wherein the object passes in proximity to the first optical station to expose the light passed by the mask of the first optical station on a first surface area of the object and the object passes in proximity to the second optical station to expose the light passed by the mask of the second optical station on a second surface area of the object.

15. The optical apparatus of claim 14, wherein the object is a spherical object.

16. The optical apparatus of claim 15, wherein the spherical object is a semiconductor device.

17. The optical apparatus of claim 14, wherein the pattern of the mask of the first optical station comprises a first ring.

18. The optical apparatus of claim 14, wherein the pattern of the mask of the second optical station comprises a second ring.

19. The optical apparatus of claim 14, wherein a first object is proximate to the first optical station while a second object is proximate to the second optical station.

20. A method of exposing light on a surface area of an object having a curvature, comprising:

passing the object in proximity to a first optical station to expose light on a first surface area of the object according to a pattern of a first mask; and

passing the object in proximity to a second optical station to expose light on a second surface area of the object according to a pattern of a second mask.

21. The method of claim 20, wherein the object is a spherical semiconductor device.

22. The method of claim 20, wherein the pattern of the first mask comprises a first ring.

23. The method of claim 20, wherein the pattern of the second mask comprises a second ring.

24. The method of claim 20, wherein a first object is proximate to the first optical station while a second object is proximate to the second optical station.

25. A method of manufacturing a semiconductor device, comprising:

passing light according to a pattern of a mask;

directing the light passed by the pattern of the mask though a lens to the surface area of the semiconductor device; and

altering a focal distance between the lens and the semiconductor device to expose the light passed by the pattern of the mask on surface areas of the semiconductor device.

26. The method of claim 25, wherein the semiconductor device is a spherical semiconductor device.

27. The method of claim 25, further including:

providing a first ring for the pattern of the mask; and

setting a first focal distance between the lens and the semiconductor device to expose the first ring on a first surface area of the semiconductor device.

28. The method of claim 27, further including:

providing a second ring for the pattern of the mask; and

setting a second focal distance between the lens and the semiconductor device to expose the second ring on a second surface area of the semiconductor device.

29. The method of claim 28, further including moving the semiconductor device relative to the lens to set the first and second focal distances between the lens and the semiconductor device.

30. A method of manufacturing a semiconductor device, comprising:

passing the semiconductor device in proximity to a first optical station to expose light on a first surface area of the semiconductor device according to a pattern of a first mask; and

passing the semiconductor device in proximity to a second optical station to expose light on a second surface area of the semiconductor device according to a pattern of a second mask.

31. The method of claim 30, wherein the semiconductor device is a spherical semiconductor device.

32. The method of claim 30, wherein the pattern of the first mask comprises a first ring.

33. The method of claim 32, wherein the pattern of the second mask comprises a second ring.

34. The method of claim 30, wherein a first semiconductor device is proximate to the first optical station while a second semiconductor device is proximate to the second optical station.